

**To:** KHanson@ldftribe.com[KHanson@ldftribe.com]; Saari, Christopher A - DNR[Christopher.Saari@wisconsin.gov]; Greenwater, Anthony[greenwater.anthony@epa.gov]; Egan, Robert[egan.robert@epa.gov]  
**Cc:** Dee.allen@ldftribe.com[Dee.allen@ldftribe.com]; Manville, Jennifer[manville.jennifer@epa.gov]  
**From:** Dave Larsen  
**Sent:** Fri 6/23/2017 6:42:04 PM  
**Subject:** RE: Haskell Lake / Tower Standard tech meeting notes, 22 June 2017- suitability of Sonic at the Haskell Lake Site 6.22.2017 Tracking Matrix #4

Wells installed using sonic methods include the following:

MW9, MW10, MW11, MW12s, MW12d, MW13s, MW13d, MW14 and MW15. You are correct that not all logs correctly referenced sonic as the drill method (MW9-11 didn't) and the remainder did.

Rig was a Roto Sonic Versa-Drill V-100

It had a 4" x 10' recovery spoon and they used water to assist in drilling and keep blowup to a minimum. I have notes also that rocks had bridged between the spoon and the outer tooling and caused problems on numerous borings which eventually resulted in breaking the drill head, the contractor pulled off the job and we were done with sonic drilling at Tower Standard.

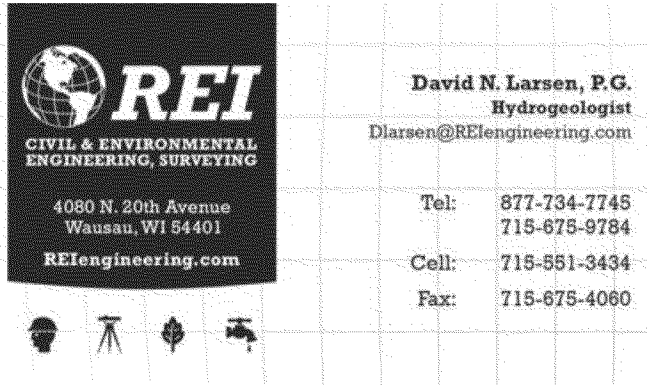
Again, it looks like sonic was successful to a point. Maybe 2017 sonic drilling will be significantly different than 2000 sonic drilling, but the basic issues I believe still remain. But as Kristen pointed out, I have not used sonic drilling methods since 2000 and the technology may have advanced to address my concerns. At the time (2000) sonic drilling was almost double the cost of HSA drilling and I don't remember any significant difference in reducing the time to install the well, but that probably has gotten better over the years also. What I do know is that soil boring/well installation has proven to be challenging and that each of the drilling methods used over the years had issues.




Kristen, who does Weston use for their sonic work? Maybe we can bring them in for a "pilot" well during proposed groundwater profiling to see if the technology of today provides the level of stratigraphic detail you are requesting?

Thank you,

David N. Larsen P.G

Hydrogeologist / Professional Geologist



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**From:** Hanson, Kristen [mailto:KHanson@ldftribe.com]

**Sent:** Friday, June 23, 2017 9:02 AM

**To:** Saari, Christopher A - DNR <Christopher.Saari@wisconsin.gov>; Greenwater, Anthony <greenwater.anthony@epa.gov>; Dave Larsen <dlarsen@reiengineering.com>; Egan, Robert <egan.robert@epa.gov>

**Cc:** Allen, Dee <dee.allen@ldftribe.com>; Manville, Jennifer (manville.jennifer@epa.gov) <manville.jennifer@epa.gov>

**Subject:** RE: Haskell Lake / Tower Standard tech meeting notes, 22 June 2017- suitability of Sonic at the Haskell Lake Site 6.22.2017 Tracking Matrix #4

Hi Chris,

I will make arrangements and get back to you.

Dave references some site activity in March. Are you aware of any PECFA funded site activities this spring?

Kristen

Sent from my Verizon, Samsung Galaxy smartphone

----- Original message -----

From: "Saari, Christopher A - DNR" <[Christopher.Saari@wisconsin.gov](mailto:Christopher.Saari@wisconsin.gov)>

Date: 6/23/17 8:22 AM (GMT-06:00)

To: "Hanson, Kristen" <[KHanson@ldftribe.com](mailto:KHanson@ldftribe.com)>, "Greenwater, Anthony" <[greenwater.anthony@epa.gov](mailto:greenwater.anthony@epa.gov)>, "Dave Larsen ([dlarsen@reiengineering.com](mailto:dlarsen@reiengineering.com))" <[dlarsen@reiengineering.com](mailto:dlarsen@reiengineering.com)>, "Egan, Robert" <[egan.robert@epa.gov](mailto:egan.robert@epa.gov)>

Cc: "Allen, Dee" <[dee.allen@ldftribe.com](mailto:dee.allen@ldftribe.com)>, "Manville, Jennifer ([manville.jennifer@epa.gov](mailto:manville.jennifer@epa.gov))" <[manville.jennifer@epa.gov](mailto:manville.jennifer@epa.gov)>

Subject: RE: Haskell Lake / Tower Standard tech meeting notes, 22 June 2017- suitability of Sonic at the Haskell Lake Site 6.22.2017 Tracking Matrix #4

Thanks Kristen. I would be interested in a conference call with Weston regarding their sonic drilling experiences. DNR is in favor of using whatever drilling method that will provide the

desired information.

**We are committed to service excellence.**

Visit our survey at <http://dnr.wi.gov/customersurvey> to evaluate how I did.

Chris Saari

Phone: (715) 685-2920

[Christopher.Saari@Wi.gov](mailto:Christopher.Saari@Wi.gov)

**From:** Hanson, Kristen [<mailto:KHanson@ldftribe.com>]

**Sent:** Thursday, June 22, 2017 5:32 PM

**To:** Greenwater, Anthony; Saari, Christopher A - DNR; Dave Larsen ([dlarsen@reiengineering.com](mailto:dlarsen@reiengineering.com)); Egan, Robert

**Cc:** Allen, Dee; Manville, Jennifer ([manville.jennifer@epa.gov](mailto:manville.jennifer@epa.gov))

**Subject:** RE: Haskell Lake / Tower Standard tech meeting notes, 22 June 2017- suitability of Sonic at the Haskell Lake Site 6.22.2017 Tracking Matrix #4

Good Afternoon,

### **Review of Old Well Logs**

I reviewed the well construction reports from the previous 1997-2006 investigation to see where sonic drilling had been attempted at the site. The well logs report only hollow-stem auger and mud rotary drilling methods. Information on previous sonic attempts and locations would be useful to our monitoring well network design discussions. Any additional information is appreciated.

### **Tribal Contractor Recommendations**

I spoke with Weston regarding the appropriateness of a sonic drilling application for the Haskell Lake Site considering REI's reports of failed attempts or other problems that included

- a) Rock stuck in the tip of a 20' sleeve resulting in unlogged intervals

b) Liquidified soils

c) Other problems

Weston Reports that sonic drilling technology and equipment has improved substantially since the 1990s. Older methods were quite a production requiring more water and more circulations than today's applications. This may explain the liquidified soil problems Dave reports from the 1990s application.

Weston experience has been successful use of sonic at sites with soils similar to the Haskell Lake Site. Also, because of the much faster drilling rate- there may be a cost savings to this method (more wells/day).

In regards to Chris's question of mini-sonic rigs and compliant wells, I was informed the term mini sonic refers to rig size and not borehole diameter. Weston also offered that

Small sonic rigs along with mini-sonic rigs have rubber tracks which are good for areas of the Haskell Lake site near the lake and pond. They work with 10 ft barrels. A full size rig likely cannot access all of those locations.

### **Tribal Call Offer**

During the call today, I had offered a call with the Tribal Contractor to share their more recent experience with sonic drilling, and the suitability of the site for sonic drilling application. Please let me know if an organized conference call is of interest, or if another method of information sharing is preferred.

Kristen Hanson

Environmental Response Program Coordinator

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**From:** Greenwater, Anthony [<mailto:greenwater.anthony@epa.gov>]

**Sent:** Thursday, June 22, 2017 4:15 PM

**To:** Hanson, Kristen; Saari, Christopher A - DNR; Dave Larsen ([dlarsen@reiengineering.com](mailto:dlarsen@reiengineering.com)); Egan, Robert

**Subject:** Haskell Lake / Tower Standard tech meeting notes, 22 June 2017

All: I attached a summary of today's discussion and action items. If you have additional info or thoughts before the next scheduled meeting, 6 July, please send them to the group.

Vr,

Anthony Greenwater, Director

Tribal and International Affairs

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